

What is claimed is:

5 1. A network infrastructure integrated system comprising :  
a telephone line network to which a first plurality of Home Information  
Machines are connected;  
a power line network to which a second plurality of Home Information  
Machines are connected;  
a gateway system connected with one of the telephone line network and  
the power line network for converting communication protocols of the telephone  
10 line network or power line network and an external network and transferring data  
signals between the telephone line network or power line network and the external  
network; and  
a network bridge connected between the telephone line network and the  
power line network for enabling the first and second pluralities of Home  
15 Information Machines to communicate data signals with each other between the  
telephone line network and the power line network.

20 2. The system according to claim 1, wherein the telephone line  
network includes PNA modems, the power line network includes PNA modems  
each having a coupler for connecting to a power line, and the gateway system  
includes PNA modems.

25 3. The system according to claim 1, wherein the first plurality of  
Home Information Machines connected to the telephone line network each a  
include PNA modem, the second plurality of Home Information Machines

connected to the power line network each include a PNA modem having a coupler for connecting to a power line, and the gateway system includes a PNA modem.

4. The system according to claim 1, wherein the telephone line network includes at least one PNA modem, the power line network includes at least one PNA modems having a coupler for connecting to a power line, and the gateway system also includes a PNA modem having a coupler for connecting to a power line.

5. The system according to claim 1, wherein the first plurality of Home Information Machines connected to the telephone line each include a PNA modem, the second plurality of Home Information Machines connected to the power line network each include a PNA modem having a coupler for connecting to a power line, and the gateway system also includes a PNA modem having a coupler for connecting to a power line.

6. The system according to claim 1, wherein the network bridge includes an input protection means for protecting internal circuitry thereof and removing unwanted the electric components of the data signal flowing on the network, matching means connected to the input means and matching impedance of the data signal to an impedance value of the PNA modems, and an output means connected to the matching means for coupling the data signal and filtering the data signal .

7. The system according to claim 6, wherein the input means

includes a plug against inputting/outputting the data signal, a protection means for protecting an overvoltage and a surge voltage, and a blocking means connected to the protection means and blocking DC or AC components.

8. The system according to claim 7, wherein the protection means includes a line filter for preventing admission of noise generated from the Home Information Machines.

9. The system according to claim 6, wherein a load impedance resistance value in the matching means is  $10k\Omega$ .

10. The system according to claim 6, wherein the output means includes an isolation and coupling means for isolating the telephone line network and the power line network from each other, a filtering means for band-pass filtering the data signal, and a socket for connecting the telephone line network or the power line network.

11. The system according to claim 10, wherein the isolation and coupling means has a transformer in which the telephone line network side and on the power line network side are connected to respective coil winding having same number with each other.

12. The system according to claim 10, wherein the filtering means is a band-pass filter which passes only signals in the range of  $4.25\text{MHz}\sim 9.75\text{MHz}$ .